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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/894,874	06/29/2001	Soon Sung Yoo	041501-5432	3407

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EXAMINER

DOTY, HEATHER ANNE

ART UNIT	PAPER NUMBER
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2813

DATE MAILED: 05/31/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

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# Office Action Summary

Application No.

09/894,874

Applicant(s)

YOO ET AL.

Examiner

Heather A. Doty

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

## Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

## Status

- 1) ☒ Responsive to communication(s) filed on 05 May 2006.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

## Disposition of Claims

- 4) ☒ Claim(s) 6-9 and 19-23 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 6-9 and 19-23 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

## Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 29 June 2001 and 31 July 2003 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

## Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some \* c) ☐ None of:
- 1) ☒ Certified copies of the priority documents have been received.
  - 2) ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  - 3) ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

## Attachment(s)

- 1) ☐ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)  
Paper No(s)/Mail Date \_\_\_\_\_

- 4) ☐ Interview Summary (PTO-413)  
Paper No(s)/Mail Date. \_\_\_\_\_
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: \_\_\_\_\_

## **DETAILED ACTION**

### ***Continued Examination Under 37 CFR 1.114***

A request for continued examination under 37 CFR 1.114, including the fee set forth in 37 CFR 1.17(e), was filed in this application after final rejection. Since this application is eligible for continued examination under 37 CFR 1.114, and the fee set forth in 37 CFR 1.17(e) has been timely paid, the finality of the previous Office action has been withdrawn pursuant to 37 CFR 1.114. Applicant's submission filed on 5/5/2006 has been entered.

### ***Claim Objections***

Claim 20 is objected to because of the following informalities: In line 3, "portin" should be changed to "portion." In line 5, "poriton" should be changed to "portion." In line 8 "input one pad" should be changed to "one input pad." In the last line, "seprated" should be changed to "separated." Appropriate correction is required.

### ***Claim Rejections - 35 USC § 103***

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims 6-9, 19, 20, 22, and 23 are rejected under 35 U.S.C. 103(a) as being unpatentable over Applicant's Admitted Prior Art (APA) in view of U.S. 5,966,589 (Watanabe et al., hereinafter Watanabe).

Regarding claim 6, APA discloses a pad structure for a liquid crystal display including a grinding area adjacent to an edge portion of a lower substrate of the liquid crystal display (II in Figs. 1 and 2 of the instant specification), a pad contact area (I in Figs. 1 and 2 of the instant specification), and an anisotropic conductive film deposit area (III in Figs. 1 and 2 of the instant specification), the pad structure comprising:

- a tape carrier package layer to receive a driving signal (**23** in Figs. 1 and 2 of the instant specification);
- an anisotropic conductive film formed on a lower portion of the tape carrier package layer and covering at least the pad contact area of the liquid crystal display (**21** in Figs. 1 and 2 of the instant specification);
- an insulating film defining a plurality of contact holes therethrough, the insulating film disposed on a lower portion of the anisotropic conductive film in the pad contact area of the liquid crystal display (**15** in Figs. 1 and 2 of the instant specification);
- a plurality of gate and data pads (**13** in Figs. 1 and 2 of the instant specification); and
- a conductive layer electrically connecting the gate and data pads to the anisotropic conductive film through the contact holes (**19** in Figs. 1 and 2 of the instant specification),

wherein the upper surfaces of the gate and data pads are completely covered by the insulating film and the conductive layer.

APA does not teach that the entire side and end surface of the gate and data pads are completely covered by the insulating film and the conductive layer, or that the pad contact area is separated from the grinding area by a predetermined interval.

Watanabe discloses a pad structure for a liquid crystal display, comprising:

a substrate **18** (Figs. 4-6: Figs. 5 and 6 are cross sections of Fig. 4);

a plurality of gate pads and data pads **3, 5, 9** formed on the substrate **18**,  
(column 9, lines 51-64;

an insulating film **13, 14, 15**, layer **13** specifically designated as a protection film  
(column 6, lines 19-22), formed on surfaces of the gate pads and data pads **3, 5, 9**, the  
insulating film defining a plurality of contact holes **10a, 10b, 10c**, therethrough; and

a plurality of conductive layers **12** electrically connected to the gate pads and the  
data pads **3, 5, 9** through the contact holes **10a, 10b, 10c** (Figs. 4-6), wherein the entire  
upper, side, and end surfaces of the gate and data pads are completely covered by the  
insulating film **13, 14, 15** and the conductive layer **12** (Figs 5 and 6).

Therefore, at the time of the invention, it would have been obvious for one of  
ordinary skill in the art to form the pad structure taught by APA, and further form the  
insulating film to cover the ends and sides of the gate and data pads in order to offer  
protection, as expressly taught by Watanabe. Covering the ends and sides of the data  
pads, as taught by Watanabe, will necessarily introduce a space between the grinding  
area and the pad contact area, since the pad contact area will be separated from the  
grinding area by the predetermined thickness of the insulating layer covering the ends  
and sides of the gate and data pads.

Regarding claim 7, Watanabe discloses that the insulating film **13-15** is formed on side surfaces and upper parts of the gate and data pads **3, 5, 9** (Figs. 5-6).

Regarding claim 8, APA and Watanabe both disclose that the gate and data pads (**13** in APA; **3, 5, 9** in Watanabe) are formed on a substrate (**11** in APA; **18** in Watanabe), and Watanabe further teaches that the insulating film **13-15**—particularly **14**—contacts the substrate at end portions of the gate pads and the data pads **3, 5, 9** (Figs. 5-6).

Regarding claim 9, Watanabe discloses that the gate insulating film **14** is formed between the gate and data pads **3, 5, 9** (Figs. 4-6) to offer protection, as detailed in the rejection of claim 6 above.

Regarding claim 19, APA teaches a pad structure for a liquid crystal display including a grinding area adjacent to an edge portion of a lower substrate of the liquid crystal display (II in Figs. 1 and 2 of the instant specification) and a pad contact area (I in Figs. 1 and 2 of the instant specification), comprising:

- a substrate (**11** in Figs. 1 and 2 of the instant specification);
- at least one input pad formed on the substrate (gate pad **13** in Fig. 1 receives an input signal);
- an insulating film formed on the pad contact area of the input pad (**15** in Figs. 1 and 2); and
- at least one conductive layer (**19** in Figs. 1 and 2) connected to the input pad through contact holes defined through the insulating film, wherein the at least one conductive layer is absent from the grinding area.

APA does not teach that the insulating film entirely covers the side and end surfaces of the input pad and a portion of the substrate adjacent to the side surfaces of the input pad, or that the input pad is separated from the grinding area by a predetermined interval.

Watanabe discloses a pad structure for a liquid crystal display, comprising:

- a substrate **18** (Figs. 4-6: Figs. 5 and 6 are cross sections of Fig. 4);
- an input pad (gate line terminal **3**; column 9, lines 51-64);
- an insulating film **13, 14, 15**, layer **13** specifically designated as a protection film (column 6, lines 19-22), formed on surfaces of the gate pads and data pads **3, 5, 9**, the insulating film defining a plurality of contact holes **10a, 10b, 10c**, therethrough; and
- a plurality of conductive layers **12** electrically connected to the gate pads and the data pads **3, 5, 9** through the contact holes **10a, 10b, 10c** (Figs. 4-6), wherein the entire side and end surfaces of the pad and a portion of the substrate adjacent the side surfaces of the pad are completely covered by the insulating film **13, 14, 15** (Figs 5 and 6).

Therefore, at the time of the invention, it would have been obvious for one of ordinary skill in the art to form the pad structure taught by APA, and further form the insulating film to cover the ends and sides of the gate and data pads in order to offer protection, as expressly taught by Watanabe. Covering the ends and sides of the data pads, as taught by Watanabe, will necessarily introduce a space between the grinding

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area and the input pad, since the input pad will be separated from the grinding area by the predetermined thickness of the insulating layer covering the ends and sides of pad.

Regarding claim 20, APA teaches a liquid crystal display formed on a substrate, comprising:

- an active region defined at a first portion of the substrate ("Active" in Figs. 1 and 2 of the instant specification);
- a grinding area defined at a second portion of the substrate, wherein the grinding area is adjacent to an edge portion of the substrate ("II" in Figs. 1 and 2); and
- a pad contact area ("I" in Figs. 1 and 2) defined on a third portion of the substrate between and adjacent to each of the active region and the grinding area, the pad contact area including:
  - at least one input pad formed on the substrate (gate pad 13 in Fig. 1 receives an input signal);
  - an insulating film formed on the input pad (15 in Figs. 1 and 2), at least one conductive layer connected to the input pad through contact holes defined through the insulating film (19 in Figs. 1 and 2), wherein the at least one conductive layer is absent in the grinding region.

APA does not teach that the insulating film covers the entire side and end surfaces of the input pad and a portion of the substrate adjacent to the side and end surfaces of the input pad, or that the input pad is separated from the grinding area by a predetermined interval.

Watanabe discloses a pad structure for a liquid crystal display, comprising:

- a substrate **18** (Figs. 4-6: Figs. 5 and 6 are cross sections of Fig. 4);
- an input pad (gate line terminal **3**; column 9, lines 51-64);
- an insulating film **13, 14, 15**, layer **13** specifically designated as a protection film (column 6, lines 19-22), formed on surfaces of the gate pads and data pads **3, 5, 9**, the insulating film defining a plurality of contact holes **10a, 10b, 10c**, therethrough; and
- a plurality of conductive layers **12** electrically connected to the gate pads and the data pads **3, 5, 9** through the contact holes **10a, 10b, 10c** (Figs. 4-6), wherein the entire side and end surfaces of the pad and a portion of the substrate adjacent the side surfaces of the pad are completely covered by the insulating film **13, 14, 15** (Figs 5 and 6).

Therefore, at the time of the invention, it would have been obvious for one of ordinary skill in the art to form the pad structure taught by APA, and further form the insulating film to cover the ends and sides of the gate and data pads in order to offer protection, as expressly taught by Watanabe. Covering the ends and sides of the data pads, as taught by Watanabe, will necessarily introduce a space between the grinding area and the input pad, since the input pad will be separated from the grinding area by the predetermined thickness of the insulating layer covering the ends and sides of pad.

Regarding claims 22 and 23, APA and Watanabe together teach the pad structure according to claim 19 and the liquid crystal display according to claim 20 (note

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35 U.S.C. 103(a) rejections above). APA further teaches that the at least one conductive layer is indium tin oxide (paragraph 0009 of the instant specification).

Claim 21 is rejected under 35 U.S.C. 103(a) as being unpatentable over Applicant's Admitted Prior Art (APA) in view of U.S. 5,966,589 (Watanabe et al., hereinafter Watanabe), as applied to claim 6 above, and further in view of U.S. 6,016,174 (Endo et al., hereinafter Endo).

Regarding claim 21, APA and Watanabe together teach the pad structure according to claim 6 (note 35 U.S.C. 103(a) rejection above), but do not teach that the conductive layer is completely covered by the anisotropic film.

Endo teaches a tape carrier package (TCP) LCD having a pad structure on the LCD substrate similar to that in Watanabe for a liquid crystal display including a plurality of gate pads and data pads **20, 24** formed on the substrate (Figs. 3, 4, and 14; column 14, lines 18-27); an insulating film **3, 8** formed on surfaces of the gate pads and data pads **20, 24**; a plurality of transparent conductive layers **22, 26** formed of indium tin oxide electrically connected to the gate pads and the data pads **20, 24** (column 19, lines 9-61) through contact holes in the insulating films **3, 8**; and an anisotropic conductive film, ACF, formed on the transparent conductive layers **22, 26** to cover entire upper and side surfaces of the transparent conductive layers (not shown but expressly indicated at paragraph bridging columns 11 and 12—especially the last sentence—and at column 23, lines 9-42—especially the last two sentences). In this regard, Endo states,

In this event, as shown in Fig. 3 and Fig. 4, ACF is placed at the position **completely covering the first TCP terminal contact 22 and the second TCP terminal contact 26**, that is, the first TCP connecting range 23 and the second TCP connecting range 27. By

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doing so, the contact hole level difference portion of the TCP terminal portion is covered with ACF, and even when crack, etc. are generated in the conductive thin film at the level difference portion, the display portion lead-out electrode is no longer exposed to humidity in the atmosphere, and the corrosion by humidity can be prevented. (Emphasis added.)

Therefore, the ACF of Endo must necessarily be disposed on the insulating films 3, 8 in order to completely cover the terminal contact. In other words, if the ACF were not disposed on a portion of the insulating film 3, 8, then the terminal contact would not be completely covered, contrary to the teaching in Endo.

Accordingly, it would have been obvious for one of ordinary skill in the art, at the time of the invention, to cover the entirety of the transparent conductive film 19 of APA with the anisotropic conductive film in order to provide reliable electrical connection to the pads while protecting the connection from damage and corrosion due to humidity, as taught to be beneficial in Endo.

### ***Response to Arguments***

Applicant's arguments with respect to claims 6-9, 19, and 20 have been considered but are moot in view of the new ground(s) of rejection.

### ***Conclusion***

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Heather A. Doty, whose telephone number is 571-272-8429. The examiner can normally be reached on M-F, 8:30 - 5:00.


If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Carl Whitehead, Jr., can be reached at 571-272-1702. The fax phone

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number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

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